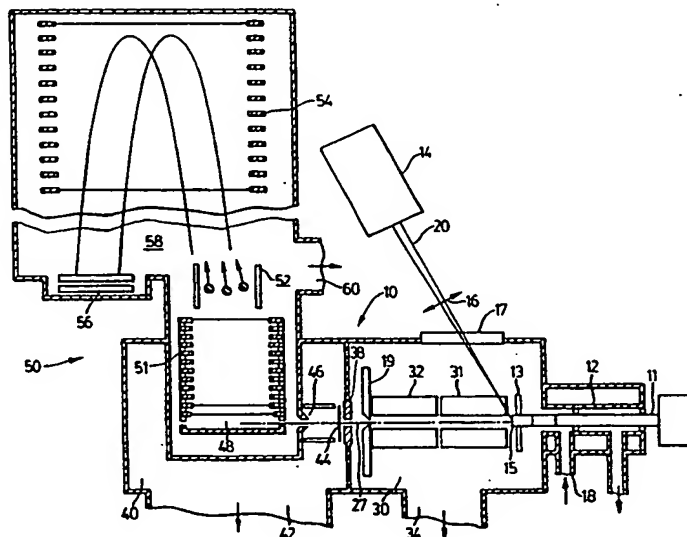




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H01J 49/42, 49/04, 49/40		A3	(11) International Publication Number: WO 99/38185
			(43) International Publication Date: 29 July 1999 (29.07.99)
(21) International Application Number: PCT/CA99/00034 (22) International Filing Date: 25 January 1999 (25.01.99) (30) Priority Data: 2,227,806 23 January 1998 (23.01.98) CA (71) Applicant (for all designated States except US): UNIVERSITY OF MANITOBA [CA/CA]; Winnipeg, Manitoba R3T 2N2 (CA). (72) Inventors; and (75) Inventors/Applicants (for US only): KRUTCHINSKY, Andrew, N. [CA/CA]; 36B-99 Roslyn Road, Winnipeg, Manitoba R3L 0G4 (CA). LOBODA, Alexandre, V. [CA/CA]; 230-140 Baylor Avenue, Winnipeg, Manitoba R3T 3P4 (CA). SPICER, Victor, L. [CA/CA]; 63 Point West Drive, Winnipeg, Manitoba R3T 5H1 (CA). ENS, Erich, W. [CA/CA]; 27 Warrendale, Winnipeg, Manitoba R2M 5B8 (CA). STANDING, Kenneth, G. [CA/CA]; 60 Kings Drive, Winnipeg, Manitoba R3T 3E5 (CA). (74) Agent: BERESKIN & PARR; 40th floor, 40 King Street West, Toronto, Ontario M5H 3Y2 (CA).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. (88) Date of publication of the international search report: 21 October 1999 (21.10.99)	

(54) Title: SPECTROMETER PROVIDED WITH PULSED ION SOURCE AND TRANSMISSION DEVICE TO DAMP ION MOTION AND METHOD OF USE



(57) Abstract

A method and apparatus are provided for providing an ion transmission device or interface between an ion source and a spectrometer. The ion transmission device can include a multipole rod set and includes a damping gas, to damp spatial and energy spreads of ions generated by a pulsed ion source. The multipole rod set has the effect of guiding the ions along an ion path, so that they can be directed into the inlet of a mass spectrometer. The invention has particular application to MALDI (matrix-assisted laser desorption/ionization) ion sources, which produce a small supersonic jet of matrix molecules and ions, which is substantially non-directional, and can have ions travelling in all available directions from the source and having a wide range of energy spreads. The ion transmission device can have a number of effects, including: substantially spreading out the generated ions along an ion axis to generate a quasi-continuous beam; reducing the energy spread of ions emitted from the source; and at least partially suppressing unwanted fragmentation of analyte ions. Consequently, a number of pulses of ions can be delivered to the time-of-flight or other spectrometer, for each cycle of the ion generation.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakistan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00034

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H01J49/42 H01J49/04 H01J49/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 195 11 333 C (BRUKER FRANZEN ANALYTIK GMBH) 8 August 1996 (1996-08-08) column 5, last paragraph - column 7, paragraph 1	1,24
P,X	--- KRUTCHINSKY A N ET AL: "Collisional Damping Interface for an Electrospray Ionization Time -of-Flight Mass Spectrometer" JOURNAL OF THE AMERICAN SOCIETY FOR MASS SPECTROMETRY, vol. 9, no. 6, 1 June 1998 (1998-06-01), page 569-579 XP004122896 ISSN: 1044-0305 cited in the application the whole document --- -/--	1-43



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

26 August 1999

Date of mailing of the international search report

02/09/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Hulne, S

INTERNATIONAL SEARCH REPORT

International Application No
PCT/CA 99/00034

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 99 30350 A (UNIV BRITISH COLUMBIA ; COLLINGS BRUCE A (CA); DOUGLAS DONALD J (CA) 17 June 1999 (1999-06-17) page 8 - page 9 -----	1,24
A	US 5 689 111 A (DRESCH THOMAS ET AL) 18 November 1997 (1997-11-18) page 5, line 28 - page 6 -----	1,24

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/CA 99/00034

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 19511333 C	08-08-1996	GB 2299446 A,B US 5763878 A	02-10-1996 09-06-1998
WO 9930350 A	17-06-1999	NONE	
US 5689111 A	18-11-1997	AU 4059597 A EP 0917728 A WO 9807177 A WO 9807178 A	06-03-1998 26-05-1999 19-02-1998 19-02-1998

THIS PAGE BLANK (USPTO)